Claims

We claim:

1. A method of treating a behavioral or psychological deficit in an animal which comprises intracerebral transplantation of a therapeutically effective amount of pluripotent neuroepithelial cells to said animal.

2. The method of claim 1, wherein tests for cognitive function are carried out before and after transplantation of said pluripotent neuroepithelial cells.

3. The method of claim 1, wherein said cells are conditionally immortal.

4. The method of claim 1, wherein said cells are isolated.

5. The method of claim 1, wherein said animal is a human.

6. The method of claim 1, wherein said cells are from a single cell line.

7. The method of claim 1, wherein said cells are a mixture of cells from two or more cell lines.

8. The method of claim 1, wherein said cells have a high degree of potency.

9. The method of claim 1, wherein the proliferation of said cells is increased by the addition of FGF2 *in vitro* under both permissive and non-permissive conditions.

10. The method of claim 1, wherein said cells differ from those found in nature only in that said cells comprise exogenous DNA necessary to provide conditional immortality, and optionally to allow cloning.

11. The method of claim 1, wherein said behavioral or psychological deficit is the result of hypoxia.

12. The method of claim 1, wherein said cells are human cells.

13. Pluripotent, neuroepithelial cells for therapeutic treatment of an animal.

14. The cells of claim 13, wherein said cells are for therapeutic treatment of a behavioral or psychological deficit of said animal.

15. The cells of claim 13, wherein said cells are conditionally immortal.

16. The cells of claim 13, wherein said cells are isolated.

17. The cells of claim 13, wherein said animal is a human.

18. The cells of claim 13, wherein said cells are from a single cell line.

19. The cells of claim 13, wherein said cells are a mixture of cells from two or more cell lines.

20. The cells of claim 13, wherein said cells have a high degree of potency.

21. The cells of claim 13, wherein the proliferation of said cells is increased by the addition of FGF2 *in vitro* under both permissive and non-permissive conditions.

22. The cells of claim 13, wherein said cells differ from those found in nature only in that said cells comprise exogenous DNA necessary to provide conditional immortality, and optionally to allow cloning.

23. The cells of claim 14, wherein said behavioral or psychological deficit is the result of hypoxia.

24. The cells of claim 13, wherein said cells are human cells.

25. A conditionally immortal, pluripotent, neuroepithelial cell line for therapeutic treatment of an animal.

26. The cell line of claim 25, wherein said cell line is for the treatment of a behavioral or psychological deficit of said animal.

27. The cell line of claim 25, wherein said animal is a human.

28. The cell line of claim 25, wherein said cell line is from a single cell line.

29. The cell line of claim 25, wherein said cell line is a mixture of cells from two or more cell lines.

30. The cell line of claim 25, wherein cells of said cell line have a high degree of potency.

31. The cell line of claim 25, wherein the proliferation of said cell line is increased by the addition of FGF2 *in vitro* under both permissive and non-permissive conditions.

32. The cell line of claim 25, wherein said cell line differs from cells found in nature only in that cells of said cell line comprise exogenous DNA necessary to provide conditional immortality, and optionally to allow cloning.

33. The cell line of claim 26, wherein said behavioral or psychological deficit is the result of a transient loss of blood supply to the brain of said animal.

34. The cell line of claim 25, wherein cells of said cell line are human cells.

35. A process for the production of human, conditionally immortal, pluripotent, neuroepithelial cells which comprises the steps of:

(a) obtaining neuroepithelial cells from a human fetus, said neuroepithelial cells being at a stage early enough in the developmental pathway that said neuroepithelial cells have the ability to differentiate into a variety of different brain cell types;

(b) introducing into said neuroepithlial cells DNA which comprises a sequence capable of causing said neuroepithlial cells to be conditionally immortal under the control of appropriate control elements; and

(c) maintaining said neuroepithelial cells *in vitro* under permissive conditions.

36. The process of claim 35, which further includes the step of cloning said neuroepithelial cells to obtain one or more cell lines.

37. A pharmaceutical composition comprising cells of claim 13 and a pharmaceutically acceptable carrier.

38. A pharmaceutical composition comprising cells from the cell line of claim 25 and a pharmaceutically acceptable carrier.

39. A pharmaceutical composition comprising cells obtained according to the process of claim 64 and a pharmaceutically acceptable carrier.

40. A method of testing comprising maintaining a population of cells of a conditionally immortal pluripotent neuroepithelial cell line *in vitro* and culturing portions of said cells under permissive conditions in the presence and absence of a growth factor and determining the proliferation of the cells.

41. The method of testing according to claim 40, which further comprises culturing portions of said cells under non-permissive conditions in the presence and absence of a growth factor and determining the proliferation of said cells.

42. A mammal which has undergone the method of treatment according to claim 1.

43. A cell line comprising conditionally immortal, pluripotent, neuroepithelial stem cells, wherein said cell line is obtainable by culturing said stem cells under permissive conditions in serum-free medium.

44. The cell line of claim 43, wherein said serum-free medium comprises a growth factor.

45. The cell line of claim 44, wherein said growth factor is FGF2.

46. Cells obtainable from a cell line of claim 43.

47. The cells according to claim 46, wherein said cells are for use in a method of therapeutic treatment of an animal.

48. The cells according to claim 47, wherein said therapeutic treatment is a treatment of a behavioral or psychological deficit of said animal.

49. A method of treating an animal having a damaged brain, said method comprising intracerebral transplantation of a therapeutically effective amount of a cell line into the damaged brain of said animal, said cell line comprising conditionally immortal, pluripotent, neuroepithelial stem cells, wherein said cell line is obtainable by culturing said stem cells under permissive conditions in serum-free medium into the damaged brain of said animal.

50. The method of claim 49, wherein said serum-free medium comprises a growth factor.

51. The method of claim 49, wherein said growth factor is FGF2.

52. A method for treating a behavioral or psychological deficit caused by damage to, or loss of, brain cells in a mammal which comprises intracerebral transplantation to said mammal of undifferentiated pluripotent cells having neuronal and glial potential, wherein said transplanted cells migrate and differentiate to replace, or compensate for, said lost or damaged brain cells.

53. The method of claim 52, wherein said undifferentiated pluripotent cells are conditionally immortal.

54. The method of claim 52, wherein said undifferentiated pluripotent cells are nestin-positive prior to said intracerebral transplantation.

55. The method of claim 52, wherein said undifferentiated pluripotent cells are from a clonal cell line.

56. The method of claim 52, wherein said behavioral or psychological deficit is the result of hypoxia.